WE CLAIM:

1. A cancer peptide, functional portion or derivative wherein the peptide is encoded by a nucleic acid sequence consisting of a portion of SEQ. ID NO: 2, wherein said portion encodes a peptide immunologically recognized by antigen specific cytotoxic T lymphocytes.

2. A cancer peptide, functional portion or derivative thereof wherein the peptide is encoded by a nucleic acid sequence consisting of SEQ. ID NO: 3 or portion thereof.

3. A cancer peptide consisting of a portion of SEQ. ID NO: 4 or derivative thereof, wherein said portion is immunologically recognized by antigen specific cytotoxic T lymphocytes.

4. A cancer peptide consisting of SEQ. ID NO: 5 or portion or derivative thereof.

5. A cancer peptide, portion or derivative thereof according to claim 2-4 or 5 wherein the cancer peptide is immunologically recognized by HLA restricted cytotoxic T lymphocytes.

6. A cancer peptide, portion or derivative thereof according to claim 1-3 or 4 wherein the cytotoxic T lymphocytes are MHC class I restricted.

7. A cancer peptide, portion or derivative thereof according to claim 1-5 or 6 wherein the cancer peptide is derived from a cancer selected from the group consisting of: a non-Hodgkins lymphoma, leukemia, Hodgkins lymphoma, lung cancer, liver cancer, metastases, melanoma, adenocarcinoma, thymoma, colon cancer, uterine cancer, breast cancer, prostate cancer, ovarian cancer, cervical cancer, bladder cancer, kidney cancer, pancreatic cancer and sarcoma.

8. A cancer peptide, portion or derivative thereof according to claim 1-6 or 7 wherein the cancer peptide or portion thereof is present on primary breast tumor isolates and melanoma cells.

9. A cancer peptide, portion or derivative thereof according to claim 1 wherein the peptide is encoded by a nucleic acid sequence consisting of SEQ. ID NO: 51.

R1.126 10. A cancer peptide, portion or derivative thereof according to claim 2 wherein the cancer peptide consists of the amino acid sequence:

ASGPGGGAPR (SEQ ID NO. 25), or derivative thereof.

R1.126 11. A cancer peptide according to claim 10, further consisting of an addition of 1 to about 10 amino acids at the N-terminus of SEQ. ID NO: 25.

R1.126 12. A cancer peptide according to claim 10, further consisting of an addition of 1 to about 5 amino acids at the N-terminus of SEQ. ID NO: 25.

R1.126 13. The cancer peptide, portion or derivative thereof according to claim 2 wherein the cancer peptide consists of the amino acid sequence:

R1.126 ASGPGGGAPK (SEQ. ID NO: 39).

14. The cancer peptide, portion or derivative thereof according to claim 2 wherein the cancer peptide consists of the amino acid sequence:

R1.126 AGAARASGPGGGAPR (SEQ. ID NO: 26)

15. The cancer peptide, portion or derivative thereof according to claim 2 wherein the cancer peptide consists of the amino acid sequence:

R1.126 RGPRGAGAARASGPGGGAPR (SEQ. ID NO: 45).

16. A cancer peptide, portion or derivative thereof according to claim 2 wherein the cancer peptide consists of the amino acid sequence:

R1.126 TVSGNILTIR (SEQ. ID NO: 15).

17. A cancer peptide or analog thereof consisting of the amino acid sequence:

Xaa_1Xaa_2 Xaa_3GPGGGAPXaa_4, wherein Xaa_1 is no amino acid or one to 10 amino acids, Xaa_2 is Ala, Thr, Val, Leu or Arg, Xaa_3 is Ser or a conservative amino acid substitution, and Xaa_4 is Arg or Lys.

R1.126 18. The cancer peptide according to claim 17 wherein the conservative amino acid at Xaa_3 is selected from the group consisting of Ala, Val, Ile, Leu and Thr.

20. The cancer peptide according to claim 18 wherein Xaa_1 is at least one amino acid selected from the group consisting of Ala, Gly, Arg or combinations thereof.

21. The cancer peptide according to claim 18 wherein Xaa_2 is Ala, Val or Thr.

22. The cancer peptide according to claim 18 wherein Xaa_2 is Arg.

23. The cancer peptide according to claim 18 wherein Xaa_4 is Arg and Xaa_1 is one to 5 amino acids selected from the group consisting of Ala, Gly, Arg or combinations thereof.

24. A cancer peptide, portion or derivative thereof encoded by an alternative open reading frame consisting of SEQ. ID NO. 3, variant or homolog thereof

26. A cancer peptide, portion or derivative thereof according to claim 24 wherein the peptide comprises the amino acid sequence:

LAAQERRVPR (SEQ. ID NO: 47).

27. A cancer peptide, portion or derivative thereof according to claim 24 wherein the peptide comprises the amino acid sequence:

AAQERRVPR (SEQ. ID NO: 46).

28. A pharmaceutical composition comprising at least one cancer peptide according to claims 2-24, 26 or 27 and a pharmaceutically acceptable carrier.

29. A pharmaceutical composition consisting essentially of a peptide having a portion of SEQ. ID NO. 4, said portion is immunologically recognized by antigen specific cytotoxic T lymphocytes, a peptide having SEQ. ID NO: 5, SEQ. ID NO: 14, SEQ. ID NO: 25, SEQ. ID NOS: 34-38, 41, 42, 46, 47 or combinations thereof and a pharmaceutically acceptable carrier.

30. A immunogen comprising the cancer peptide according to claims 2-24, 26 or 27 alone or in combination with at least one immunostimulatory molecule, said immunogen elicits antigen specific cytotoxic T lymphocytes.

31. A immunogen according to claim 30 wherein the

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immunostimulatory molecule is an HLA molecule.

32. An isolated nucleic acid sequence consisting of a portion of SEQ ID NO: 2, or homolog thereof, wherein said portion encodes a peptide immunologically recognized by antigen specific cytotoxic T lymphocytes.

33. An isolated nucleic acid sequence consisting of SEQ ID NO.: 3 or portion or variant thereof.

34. An isolated nucleic acid sequence according to claim 33 wherein the nucleic acid sequence encodes an alternative open reading frame gene product.

35. An isolated nucleic acid sequence according to claim 32 wherein the sequence encodes an amino acid sequence:

ASGPGGGAPR (SEQ ID NO.: 25), or derivative thereof.

36. An isolated nucleic acid sequence encoding the ORF2 peptide of SEQ. ID NO: 5.

37. An isolated nucleic acid sequence according to claim 36 wherein the nucleic acid sequence encodes a cancer peptide having the amino acid sequence:

LAAQERRVPR (SEQ. ID NO: 47).

38. An isolated nucleic acid sequence according to claim 36 wherein the nucleic acid sequence encodes a cancer peptide having the amino acid sequence:

AAQERRVPR (SEQ. ID NO: 46).

39. A recombinant expression vector comprising the nucleic acid sequence according to claims 32-37 or 38.

40. A host organism transformed or transfected with a recombinant expression vector according to claim 39.

41. A host organism according to claim 40 wherein the host organism is an antigen presenting cell.

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Sub A5 R1.126 42. An oligonucleotide consisting of a nucleic acid sequence complementary to the nucleic acid sequence according to claims 32-37 or 38.

R1.126 43. A recombinant virus comprising a recombinant virus which has incorporated into a viral genome or portion thereof the nucleic acid sequence according to claims 32-37 or 38.

R1.126 44. A recombinant virus according to claim 43 further comprising at least one gene encoding an immunostimulatory molecule.

R1.126 45. The recombinant virus according to claim 43 wherein the virus is selected from the group consisting of retrovirus, baculovirus, Ankara virus, fowlpox, adenovirus, and vaccinia virus.

R1.126 46. The recombinant virus according to claim 43 wherein the cancer peptide is derived from melanocytes.

R1.126 47. A recombinant virus according to claim 44 wherein the immunostimulatory molecule is a HLA class I molecule.

Sub A6 R1.126 48. A host organism transformed or transfected with the recombinant virus according to claim 43-46 or 47.

R1.126 49. An isolated antibody or antigen binding portion thereof that binds the cancer peptide, or portion thereof encoded by SEQ ID NO: 3.

R1.126 50. An isolated antibody that binds a cancer antigen consisting of SEQ ID NOS: 5, 6, 14, 25, 34-38, 41, 42, 46, 47 or a fragment thereof.

R1.126 51. An isolated antibody that binds the cancer peptide, antigen or variant thereof of claim 11.

R1.126 52. A method of producing a recombinant cancer peptide or portion thereof comprising:

a. inserting a nucleotide sequence of SEQ ID NO.: 3

or portion or variant thereof, or a portion or variant of SEQ ID NO. 2, into an expression vector;

b. transferring the expression vector into a host cell;

c. culturing the host cell under conditions appropriate for expression of the cancer peptide or portion thereof; and

d. harvesting the recombinant cancer peptide, or portion thereof.

R1.126 51 54. A method according to claim 55 50 further comprising in step (a) inserting a nucleotide sequence encoding an HLA class I molecule, or portion thereof into the expression vector.

R1.126 53 55. A method of detecting the presence of cancer or precancer in a mammal comprising:

a. contacting a nucleic acid sequence of SEQ ID NO.: 3 or portion or variant thereof, or a portion of SEQ ID NO. 2 with a test biological sample of mRNA taken from the mammal under conditions allowing for a complex to form between the sequence and the mRNA;

b. detecting the complex;

c. comparing the amount of mRNA in the test sample with an amount of mRNA from a known normal biological sample, wherein an increased amount of mRNA from the test sample is indicative of cancer or precancer.

R1.126 53 56. A method according to claim 55 52 wherein the cancer or precancer is melanoma.

R1.126 54 57. A method according to claim 55 52 wherein the biological sample is from breast tissue.

R1.126 55 58. A method of detecting an CAG-3 genomic nucleic acid sequence in a biological sample comprising:

a. contacting the genomic nucleic acid sequence with SEQ

ID NO.: 3, 51, or portion or variant thereof under conditions to allow complexes to form between the genomic nucleic acid sequence; and

b. detecting the complex.

59. A method of detecting the cancer peptide or portion thereof according to claims 1-23, 24 or 25 in a biological sample comprising:

a. contacting the sample with antibodies specific for said cancer peptide under conditions to form an immune complex, and

b. detecting the presence of the immune complex.

60. A method of preventing or inhibiting cancer in a mammal comprising: administering to the mammal an effective amount of the cancer peptide, or portion thereof according to claims 1-23, 24 or 25, alone or in combination with an HLA molecule, said amount is effective in preventing or inhibiting the cancer in the mammal

61. A method of inhibiting melanoma in a mammal comprising:

a. exposing T lymphocytes *in vitro* to a cancer peptide, tumor antigen or portion thereof according to claims 1-23, 24 or 25, alone or in combination with an MHC molecule for a time sufficient to elicit cancer peptide specific T lymphocytes;

b. administering the cancer peptide specific T lymphocytes to the mammal in an amount sufficient to inhibit the melanoma.

62. A method of preventing or inhibiting cancer in a mammal comprising administering to the mammal an effective amount of the cancer peptide according to claims 1-23, 24 or 25 alone, or in combination with an HLA molecule, said amount is effective in preventing or inhibiting cancer in a mammal.

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63. A method of preventing or inhibiting cancer in a mammal comprising administering to the mammal an effective amount of a recombinant virus according to claims 43-46 or 47 alone or in combination with an exogenous immunostimulatory molecule said amount is effective in preventing or inhibiting the cancer.

64. A method according to claim 63 wherein the mammal expresses an HLA Class I molecule selected from the group consisting of HLA-A31, HLA-A3, HLA-A11, HLA-A33, or HLA-A68.

65. A pharmaceutical composition comprising the recombinant virus according to claims 43-46 or 47 alone or in combination with an exogenous immunostimulatory molecule, chemotherapy drug, antibiotic, antifungal drug, antiviral drug or combination thereof and a pharmaceutically acceptable carrier.

66. A transgenic animal carrying and expressing a gene consisting of SEQ ID NO: 3 or portion thereof, or a portion of SEQ ID NO. 2, wherein said portion encodes a peptide immunologically recognized by antigen specific cytotoxic T lymphocytes

67. A cancer antigen specific human cytotoxic T lymphocyte elicited by the cancer peptide according to claim 2-24, 26 or 27.

68. The cancer antigen specific human cytotoxic T lymphocyte according to claim 67, wherein the lymphocyte recognizes an HLA-A31 molecule.

69. The cancer antigen specific human cytotoxic T lymphocyte according to claim 67, wherein the lymphocyte recognizes an HLA Class I molecule selected from the group consistingof HLA-A3, HLA-A11, HLA-A33, and HLA-A68.

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